

## **AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A system for channel coding data within a digital communications system comprising:
  - a data receiving circuit for receiving a digital input data sequence and periodically inserting known symbols into the digital input data sequence and forming an expanded digital input data sequence based on a constraint length; and
  - an encoder operatively connected to said data receiving circuit for trellis encoding the expanded digital input data sequence to produce a channel coded data stream such that the number of connections between trellis nodes in a trellis are reduced, said encoder operative according to the constraint length.
2. (Original) A system according to Claim 1, wherein the known symbols that are inserted comprise zeros.
3. (Original) A system according to Claim 2, wherein the inserted zeros comprise an equivalent time varying convolutional code.
4. (Original) A system according to Claim 1, wherein said encoder comprises a convolutional encoder
5. (Original) A system according to Claim 1, wherein the encoder applies code words that are one-to-one mappings of the distinct paths on a trellis to binary sequences.

6. (Original) A system according to Claim 1, wherein the topology of the trellis corresponds to memory length  $m$ , and the known symbols are inserted after each  $m$  symbol within the input data sequence.

7. (Original) A system according to Claim 1, wherein the encoder is operative as a generator matrix having a constraint length  $k=m-1$ , wherein  $m$  corresponds to the memory length, and the code rate is  $R=1/1$  such that the known symbols are inserted after each  $k-1$  information bit.

8. (Original) A system according to Claim 1, and further comprising a Maximum Likelihood (ML) decoder for receiving and decoding the channel coded data stream.

9. (Original) A system according to Claim 8, wherein the Maximum Likelihood (ML) decoder comprises a Viterbi decoder.

10. (Currently Amended) A method of channel coding data in a digital communications system comprising the steps of :  
receiving a digital input data sequence;  
periodically inserting known symbols into the digital input data sequence and forming an expanded digital input data sequence based on a constraint length; and  
trellis encoding the expanded digital input data sequence based on the constraint length to produce a channel coded data stream such that the number of connections between trellis nodes in a trellis are reduced.

11. (Original) A method according to Claim 10, wherein the step of inserting known symbols comprises the step of inserting zeros into the digital input data sequence.
12. (Original) A method according to Claim 11, wherein the inserted zeros comprise an equivalent time varying convolutional code.
13. (Original) A method according to Claim 10, and further comprising the step of applying code words that are one-to-one mappings of the distinct paths on a trellis to binary sequences.
14. (Original) A method according to Claim 10, wherein the topology of the trellis corresponds to the memory length  $m$ , and further comprising the step of inserting a known symbol after each  $m$  symbol within the input data sequence.
15. (Original) A method according to Claim 10, and further comprising the step of decoding channel coded data stream within a maximum likelihood (ML) decoder.
16. (Original) A method according to Claim 15, and further comprising the step of decoding the channel coded data stream within a Viterbi decoder.

17. (Currently Amended) A method of channel coding data in a digital communications system comprising the steps of:

receiving a digital input data sequence;

periodically inserting known symbols into the digital input data sequence and forming an expanded digital input data sequence based on a constraint length  $k=m-1$ , wherein  $m$  corresponds to a memory length and a code rate is  $R=1/l$ , such that the known symbols are inserted after each  $k-1$  information bit; and

trellis encoding the expanded digital input data sequence to produce a channel coded data stream by producing a generator matrix having  $[[a]]$  the constraint length,  $k=m-1$ , wherein  $m$  corresponds to the memory length and the code rate is  $R=1/l$  such that the known symbols are inserted after each  $k-1$  information bit wherein the number of connections between trellis nodes in a trellis are reduced.

18. (Original) A method according to Claim 17, wherein the step of inserting known symbols comprises the step of inserting zeros into the digital input data sequence.

19. (Original) A method according to Claim 18, wherein the inserted zeros comprise an equivalent time varying convolutional code.

20. (Original) A method according to Claim 17, and further comprising the step of applying code words that are one-to-one mappings of the distinct paths on a trellis to binary sequences.

21. (Original) A method according to Claim 17, and further comprising the step of decoding channel coded data stream within a maximum likelihood (ML) decoder.

22. (Original) A method according to Claim 21, and further comprising the step of decoding the channel coded data stream within a Viterbi decoder.